

## ROLE OF USG FINDINGS AS A PREDICTIVE MARKER IN THREATENED ABORTION

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**Article Info:** Received 08 February 2021; Accepted 28 March 2021

**DOI:** <https://doi.org/10.32553/ijmbs.v5i4.1853>

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**Conflict of interest:** No conflict of interest.

### Abstract

**Background:** The Centers for disease control and prevention, and the World Health Organization all define abortion as pregnancy termination before 20 week gestation or with fetus born weighing <500g<sup>[1]</sup>. Early pregnancy USG parameters: - fetal crown-rump length (CRL), the presence/absence of sub-chorionic hematoma and Fetal Heart Rate (FHR) are good predictors of outcome.

**Material and Methods:** The study was conducted in the Department of Obstetrics and Gynaecology, S.P. Medical College Bikaner & associated Group of Hospital, Bikaner, Rajasthan. This is a hospital based prospective comparative study. The study group comprise of pregnant females attending Obstetrics and Gynaecology OPD. A total of 200 pregnant women are examined in this study. We divided these patients into 2 groups i.e group A and group B. Group A consists of 100 pregnant females with threatened abortion and group B with 100 normal pregnant female.

**Results:** FHR at 115bpm is 76.32% sensitive, 90.32% specific in predicting abortion with 82.86% positive predictive value and 86.15% negative predictive value. While CRL at 11 mm is 50% sensitive, 69.35% specific in predicting abortion with 55% positive predictive value and 69.35% negative predictive value.

**Conclusion:** FHR is best predictive marker followed by presence or absence of sub-chorionic hematoma and CRL in threatened abortion which results in loss of pregnancy.

**Keywords:** Pregnancy, Abortion, Threatened, USG

### Introduction

The Centers for disease control and prevention, and the World Health Organization all define abortion as pregnancy termination before 20 weeks gestation or with fetus born weighing <500g<sup>[1]</sup>. More than 80 percent of abortions occur in the first 12 weeks of pregnancy and at least half result from chromosomal anomalies. After the first trimester, both the abortion rate and the incidence of chromosomal anomalies decrease.<sup>2</sup> Abortion may be spontaneous or induced. Threatened abortion is a type of spontaneous abortion

The definition of threatened abortion by WHO is, pregnancy related bloody vaginal discharge or frank bleeding during its first half of pregnancy without cervical dilatation.<sup>3</sup> It is accounted for to happen in around one-fifth of pregnancies.<sup>4</sup>

Threatened abortion progress to pregnancy loss in about 50 percent cases. Additionally, first trimester bleeding assumes a role in the occurrence of late pregnancy complication.<sup>5-8</sup> Hence by preventing and managing threatened abortion complications can be avoided.

Numerous sonographic criteria have been studied to predict the outcome of threatened abortion.<sup>9</sup>

Various sonographic signs have been described to predict pregnancy outcome. Here signs included are gestational sac not corresponding to gestational age, or irregularly shaped gestational sac, a low implantation site, a large or irregular yolk sac, a weak decidual reaction, and slow embryonic heart rate.<sup>10</sup>

Early pregnancy markers in patients with threatened abortion including the size of gestational sac, size and shape of yolk sac, fetal crown-rump length (CRL), the presence/absence of sub-chorionic hematoma and Fetal Heart Rate (FHR) are good predictors of outcome.

### Material and Methods

**Study Population:** The study was conducted in the Department of Obstetrics and Gynaecology, S.P. Medical College Bikaner & associated Group of Hospital, Bikaner, Rajasthan from 1<sup>st</sup> September 2019 to 31<sup>st</sup> August 2020. This is a hospital based prospective comparative study. The study group comprise of pregnant females attending Obstetrics and Gynaecology OPD. A total of 200 pregnant women are examined in this study. We divided these patients into 2 groups i.e group A and group B. Group A consists of 100 pregnant female with threatened abortion and group B with 100 normal pregnant female.

**Inclusion criteria:** 1. Patient who presented with complain of vaginal bleeding, closed and uneffaced cervix and/or abdominal pain at 6-12 weeks of gestational age.

2. The pregnancy should be confirmed by a visible gestational sac of a live embryo, verified by cardiac activity on a real time ultrasound and gestational age was calculated by their last menstrual period, in both groups.

3. Age of women (18 to 40 years).

**Exclusion criteria:** 1. Other abortions (incomplete or missed abortion)

2. Molar pregnancy.

3. Ectopic pregnancy.

4. Women not willing to participate in the study are excluded.

**Data collection:** After careful and thorough history, physical, and sonographic examination to confirm gestational age, fetal viability, intrauterine single gestation and after full filling the inclusion criteria and after taking informed consent, the participants were allocated in two groups.

**Data Analysis:** To collect required information from eligible patients a pre-structured pre-tested Performa was used. For data analysis Microsoft excel and statistical software SPSS will be used and data were analyzed with the help of frequencies, figures, proportions, measures of central tendency, appropriate statistical test.

## Result

**Table 1:** Distribution of patients in both groups.

Pregnancy	Group A		Group B	
	No. of Patients	Percentage	No. of Patients	Percentage
Continued	62	62	82	82
Aborted	38	38	18	18
Total	100	100	100	100

Our study population is classified in 2 groups i.e. group A is case group and group B is control group. Out of 100 patients of group A 62% patients continued pregnancy and 38% patients aborted and for group B 82% patients continued pregnancy and 18% aborted.

In Study, majority 73% and 74% patients of group A and B respectively are lower class category. The p-value is 0.87. The result is non-significant as p-value is >0.05.

In our study, most of the patients 56% were of age 25-30 years in group A and in group B 52 % patients were <25years of age. Mean age of group A is 24.95±3.40 years and of group B is 24.62±3.28 years. p-value 0.87

In our study, majority 39% and 42% patients are of nullipara, 29% and 28% patients are of 1 parity, 22% and 22% of patients are of 2 parity respectively for group A and group B. The result is non-significant.

Majority 48% patients are of gestational age 8-10 weeks for both groups. Mean gestation age for group A is 8.81±1.74weeks and for group B is 8.61±1.78 weeks. The p-value is 0.42. The result is non-significant.

**Table 2:** Distribution of patients according to Subchorionic Haematoma

Subchorionic Haematoma	Group A		Group B		P VALUE
	No. of Patients	Percentage (%)	No. of Patients	Percentage (%)	
Absent	85	85	96	96	0.008
Present	15	15	4	4	0.008
Total	100	100	100	100	

In our study, majority 85% in group A and 96% patients in group B had no subchorionic haematoma. 15% in group A and 4% in group B had subchorionic haematoma. The p-value is 0.008, the result is significant.

**Table 3:** Distribution of patients according to ultrasound parameters in group A.

Parameter	Group A				p value
	Aborted		Continued		
	Mean	SD	Mean	SD	
CRL (mm)	19.31	13.22	22.17	15.49	0.16
FHR (per minute)	108.89	14.46	128.32	13.51	<0.0001

Table shows, Mean CRL is 19.31 (SD=13.22) for group A (Aborted) and 22.17 (SD=15.49) for Group A (continued). Mean FHR for group A (Aborted) is 108.89 (SD=14.46) per minute and for Group A (continued) is 128.32 (SD=13.51) per minute. The p value for CRL is 0.16 and for FHR is <0.0001.

**Table 4:** Distribution of patients according to ultrasound parameters in group B.

Parameter	Group B				p value
	Aborted		Continued		
	Mean	SD	Mean	SD	
CRL (mm)	16.44	11.37	23	15.1	0.0006
FHR (per minute)	105.55	5.11	127.12	14.79	<0.0001

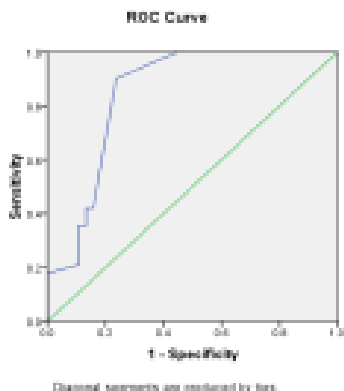
According to table, Mean CRL is 16.44 (SD=11.37) for group B (Aborted) and 23 (SD=15.1) for Group B (continued). Mean FHR for group B (Aborted) is 105.55 (SD=5.11) per minute and for Group B (continued) is 127.12 (SD=14.79) per minute. The p value for CRL is 0.0006 and for FHR is <0.0001.

**Table 5:** ROC analysis for FHR and CRL for predicting abortion.

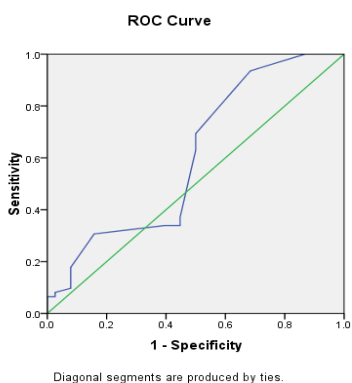
PARAMTER	AUC	P-VALUE	CI 95%	CUTOFF
CRL	0.606	0.076	0.485-0.727	11
FHR	0.846	<0.001	0.755-0.937	115

ROC curves of FHR and CRL in predicting abortion were plotted. The AUC for FHR and CRL 0.846 (95% CI 0.755-

0.937) and 0.606 (95% CI 0.755-0.937), respectively. ROC curve gives cut off level of FHR 115bpm and of CRL 11 mm in predicting the risk of abortion



**Figure 5a:** ROC analysis for FHR for predicting abortion



**Figure 5b:** ROC analysis for CRL for predicting abortion

**Table 6:** sensitivity, specificity, PPV, NPV of FHR for abortion.

	Aborted	Continued
FHR (<115)	29	6
FHR (≥115)	9	56
Sensitivity	76.32%	
Specificity	90.32%	
PPV	82.86%	
NPV	86.15%	
Accuracy	85%	

In this study we found that FHR was 76.32% sensitive, 90.32% specific in predicting abortion with 82.86% positive predictive value and 86.15% negative predictive value.

**Table 7:** Sensitivity, Specificity, PPV, NPV of CRL for abortion.

	Aborted	Continued
CRL (<11)	19	19
CRL (≥11)	19	43
Sensitivity	50%	
Specificity	69.35%	
PPV	50%	
NPV	69.35%	
Accuracy	62%	

CRL was 50% sensitive, 69.35% specific in predicting abortion with 50% positive predictive value and 69.35% negative predictive value.

**Discussion**

The first trimester vaginal bleeding is common obstetrical complication, occurring in 25% of all pregnancies. Threatened miscarriage defined as vaginal bleeding between 24 weeks in closed Cervical os.

According to our study mean age of group A was 24.95±3.04 years and in group B was 24.62±3.28 years. P-value was 0.48. Most of the patients 66% and 68% were illiterate in group A and group B respectively. Majority 65% and 70% patients were from rural area in group A and group B respectively. 73% and 74% patients of group A and group B respectively were lower class category. In our study 39% and 42% patients were nulliparous, 29% and 28% were para 1, 22% and 22% of patients are para 2 respectively for group A and group B. In our study mean gestational age of group A is 8.81±1.74 weeks and group B is 8.61±1.78 weeks. Mean haemoglobin for group A was 10.04±1.56 gm/dl and for group B was 9.8±1.22 mg/dl. Mean RBS for group A was 119 and for group B was 117.7. All above demographic and laboratory parameters were insignificant.

We considered ultrasound parameters SCH, CRL and FHR. Majority 85% in group A and 96% patients in group B have no subchorionic haematoma. 15% in group A and 4% in group B have subchorionic haematoma. The p-value was 0.008. The result was significant.

Mean CRL was 19.31(SD=13.22) for group A (Aborted) and 22.17 (SD=15.49) for Group A (continued). Mean CRL was 16.44 (SD=11.37) for group B (Aborted) and 23 (SD=15.1) for Group B (continued). The p value for CRL in group A 0.16 and in group B was 0.0006.

Mean FHR for group A (Aborted) 108.89 (SD=14.46) per minute and for Group A (continued) was 128.32 (SD=13.51) per minute. Mean FHR for Group B (Aborted) was 105.55 (SD=5.11) per minute and for Group B (continued) was 127.12 (SD=14.79) per minute. The p value for FHR in both group A and group B were <0.0001. The result was significant.

The AUC for FHR and CRL was 0.846 (95% CI 0.755-0.937) and 0.606 (95% CI 0.755-0.937), respectively. According to our study, CRL is 50% sensitive, 69.35% specific in predicting abortion with 50% positive predictive value and 69.35% negative predictive value. According to this study FHR is 76.32% sensitive, 90.32% specific in predicting abortion with 82.86% positive predictive value and 86.15% negative predictive value. These finding are consistent with study by Oun A E M et al<sup>11</sup> and Maged<sup>12</sup>. However, Maged<sup>12</sup> and Al Mohamady et al<sup>13</sup>. (2016) reported that, there was no significant difference between groups as regard to crown rump length, and these results are confirmed in the present work. Regarding fetal heart rate, results of the present study was in agreement with Doubilet and Benson's<sup>14</sup> and Tannirandorn et al findings.<sup>15</sup>

**Conclusion:**

USG is inexpensive, easily available, fast, non-invasive predictors of threatened abortion which may result in loss of pregnancy. FHR is the best predictive marker followed by presence or absence of sub-chorionic hematoma and CRL in threatened abortion which results in loss of pregnancy.

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